

JACG 74CE

NEWSLETTER
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THE JERSEY ATARI COMPUTER GROUP

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From the Editor's
Desk...

In This Issue

Putting together the JACG newsletter is no small task. It requires the collection of materials from contributors including articles, photos, cartoons and advertising. The material has to be read and sometimes revised. In the interest of uniformity almost everything is reprinted to conform to a standard format. Most material then has to be reduced to about 75% of its original size to optimize paper space without sacrificing readability. Photos and cartoons have to be hauled to the photostat camera and be shot as needed. In addition, there is an editorial to write, trading post and table of contents to produce, and an occasional article to be written just for fun or necessity.

Once all of this is assembled everything has to be laid out in a dummy of the finished product to produce, hopefully, a balanced result. Then comes the physical cut and paste operation of clipping material and gluing it neatly to the layout sheets in the correct order. Last minute emergencies or space requirements sometimes complicate this step.

The point of this report is not to complain or ask for a raise but to let you know that it takes an average of 15 to 20 hours a month to get it all together. I am pleased to tell you that I now have help with this task. Matt Hetman has come forward and volunteered his time to do the mechanicals. This will relieve me of considerable work and may allow me to continue as editor. We all thank Matt in advance for his commitment.

Now, your part. For the next issue we need your copy by JULY 16th. Matt will be putting the whole thing together by himself since I will be away. Be considerate and get material to us on schedule. We'll appreciate it and you'll get a better newsletter.

Frank Pazel
Editor-in-Chief, JACG Newsletter

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August Article Deadline

July 16th!

Please Submit Your Contribution Early

MARK YOUR CALENDARS!!

JACG Meeting Schedule

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August 10, 1985

September 14, 1985

October 12, 1985

November 9, 1985

December 14, 1985

From the Conn.....

I thought we had an excellent June meeting. Thanks go to Joseph Lyons, Frank Schwartz and Jordan Rudes of Enhanced Technology Associates. Music has always appealed to me and the combining of music and the computer is an exciting and promising mix. It was also a pleasant surprise that Joe announced that 10 percent of his product sales through our club will come back to JACB.

I have just purchased a Casio CZ-101 synthesizer. This is the same model of keyboard that was demonstrated at our meeting. For approximately \$300 (discount price from NY mail order stores, list is \$500), you have a state-of-the-art musical instrument that provides features as you grow and need them. The synth comes with 16 preset sounds, the provision for storing another 16 that you can create yourself and with the optional RAM cartridge, another 16 is available.

The CZ-101 also has a MIDI (Musical Instrument Digital Interface) port that can be used with MIDI interfaces for computer control of the instrument. With a MIDI interface, an Atari computer and the Casio 101 keyboard, you essentially have a multi-track tape recorder capability. As was demonstrated at our meeting, you can lay down one track at a time, then play it back while playing another voice and so on. When you are finished, you have a multi-voice musical composition that can be as simple or as complex as your skills allow.

The Casio CZ-101 has a headphone jack (so you won't annoy your housemates or neighbors) and line out jacks to connect to your HiFi amplifier or receiver. I highly recommend this instrument for playing alone or with the MIDI interface to a computer.

Music and computers, that is one direction that the future will bring to our exciting hobby/pastime/avocation. What else will the future bring? I think the CD-ROM that Atari announced at CES is the other exciting product of the future.

With approximately 550 megabytes of storage (the equivalent of 6000 Atari disks) and access time on the order of seconds, the CD-ROM has enormous potential. The Atari demonstration of this product consisted of the entire Grolier's Encyclopedia and cross-indexing information on one disk. Amazingly, that much information only required 1/4 of the discs capacity.

If you spend a moment, you can probably think of other applications for this technology. What if you took the top 10, 20 or 50 recipe books and put that information on a disc (book manuscripts are already stored on tape for electronic typesetting equipment). Then, cross indexed the entire set of information to include every word, recipe, cuisine, author, etc. Then, why not put calorie information, ingredient information and length of time required for preparation on the same disc?

So the scenario, as I imagine it, would go something like this: you're not quite sure what to cook for dinner. You look in the fridge and see that you have some eggs, cheese, yogurt, milk and broccoli. You also happen to have some flour and sugar. You boot up your Atari ST computer with the CD-ROM interface and drive attached. Moving the mouse to the cookbook icon, you click and the screen asks you to insert the recipe CD into the CD player.

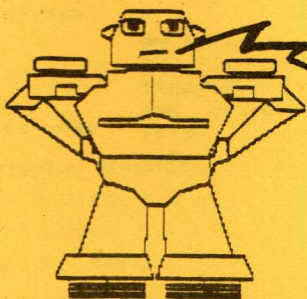
Next you select inquiry and tell the program what ingredients you have on hand. After a few seconds, the program says what cuisine do you want and you select Mexican. Then the program asks you if you want a low-calorie meal and you say yes. The program now asks if you are a novice, intermediate or expert chef and you respond with intermediate. Finally the program asks how much time you want to spend preparing the meal. Before you can say "Atari CD-ROM" you see a list of 30 recipes on the screen.

At this point, you can select any one of them and get a description of the meal, calorie information, length of time to prepare and a few other things I have not yet thought of. Once you have selected the recipe that you would like the program would ask you how many servings you would like and then displays a list of ingredients and the recipe itself. This information can be saved on your floppy disk for further use or printed on your printer. Naturally, you are hungry so you print out the recipe on your printer, tear off the page and tack the recipe up on your cupboard. You have just went from not knowing what's for dinner to getting a recipe in a few minutes.

Does this sound far-fetched? Not at all. In a matter of months this scenario could actually happen in your home. I think you will agree with me that this is the most exciting concept in computer usage in a very long time.

So, the Atari future looks very promising and the two really exciting applications I see are music/computer use and data retrieval using the CD-ROM technology.

Arthur Leyenberger
President, Jersey Atari Computer Group



YOU BETTER 'GIVE A-BIT'
THIS MONTH OR I'M GOING
TO COME AND GET YOU!!!

June Meeting Highlights

Reported by A. Leyenberger - JACG

After the preliminary question and answer session, the meeting was opened by Art. Art gave a brief overview of his trip to the Consumer Electronics Show in Chicago and mentioned a few exciting products that Atari announced. The most exciting, was a CD-ROM player, interface and software that will let the ST computer access over 550 million bytes of data. An encyclopedia application was demonstrated and others were discussed. Atari also announced the 260STD computer which has 256K bytes of memory, a built-in disk drive and GEM on ROM. This is the so-called "mass-market" computer that Atari has alluded to previously. Art also mentioned to new, inexpensive modems from Atari. It was mentioned that ANALOG magazine will have complete coverage of CES in their August issue.

Dick Kushner asked for help with a project he is working on. He would like anyone with information of computers and humor, anecdotes, articles, etc. to contact him.

Art then introduced the main speaker of the meeting. Joseph Lyons, Frank Schwartz and Jordan Rudes of Enhanced Technology Associates presented an excellent tutorial/demo/presentation of music on the Atari. Joseph showed their companies product called Virtuoso which allows the user to create and edit sounds on the Atari computer. You do not need to know how to read music to use this program. Rather, a joystick is used to simply draw the melody on the screen. Then, note names can be displayed, timing may be changed and sections cut and pasted. Virtuoso requires an Atari 130XE computer to run.

With the help of Frank and Jordan, Joseph demonstrated how MIDI (the Musical Instrument Digital Interface) is used with an Atari computer to lay down "tracks" in the computer memory. Using a pair of Casio CZ-101 synthesizers, some excellent music was heard. Joseph also mentioned that they will be coming out with MIDI Virtuoso and a MIDI interface that will run on the XE computer. MIDI Virtuoso will be available by the end of the year. ETA will also have software for the ST computer that will use their MIDI interface by mid-1986.

All in all, the folks from Enhanced Technology Associates did a fantastic job. The talk was well received and enjoyed by the audience. Joseph mentioned that, perhaps in the near future if enough interest is shown, a MIDI special interest group could be formed and he would be willing to lead tutorials on the subject.

IT'S ABOUT TIME...

THAT YOU WROTE AN
ARTICLE FOR THE
NEWSLETTER



*ASTRA SYSTEMS, INC.

June 10, 1985

Mr. Frank Pazel
Editor, JACG Newsletter
14 Whitman Drive
Denville, NJ 07834

Dear Mr. Pazel:

Thanks for the write-up in the June issue of your fine Newsletter. Unfortunately, you've made a couple of mistakes that could be troublesome. The unit we sent your club is an Astra 2001. That model is a dual drive system in which each of the drives is a SINGLE sided drive capable of handling single and true double density storage. Thus, the total double density capacity of a 2001 is 360Kbytes.

On the other hand, our Astra Big D is a dual drive system in which the drives are both DOUBLE sided, and capable of either single or true double density storage. It is the Big D that features a maximum storage capacity of 720Kbytes. Of course, the Big D, when run under a single sided DOS (such as SMARTDOS), emulates a 2001 perfectly. We supply the Big D with TOPDOS; one of the best of the DOSs that support double sided drives.

While we are very proud of both of these products, our Big D is truly the "top of the line" here at Astra.

Sincerely,


Drea M. Featherston
Plant Manager

2500 S. FAIRVIEW, UNIT L • SANTA ANA, CALIFORNIA 92704 • (714) 549-2141

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Writing For The JACG Newsletter

Articles should be submitted to the Editor by the 20th of the month for inclusion in the next issue. Submissions preferred on disk, using LJK Letter Perfect or Atari Writer. Font style should be Elite or Proportional with right hand justification. If hard copy is submitted the final printed width should be 4-1/4 inches from left margin to right margin. All formats will be considered including hand written documents if first arranged with the Editor.

We want to encourage everyone to voice his/her thoughts, knowledge, and opinions. Writing will be modified at the discretion of the Editor. No piece will be knowingly altered out of original intent.

User Group Replies to Atari

The following is a copy of a letter sent to Atari by the San Leandro Computer Club in response to Atari's proposed ST sale to User Group members. It was downloaded from CompuServe SIG*Atari xa7.

June 10, 1985

Atari Corp.
1196 Borregas Avenue
Sunnyvale, CA 94088
Attn: David Duberman

Dear Dave:

We regret to inform you that the membership of the San Leandro Computer Club will not buy any Atari 520 ST computers through your user group offer. The membership did, however, authorize us to explain in some detail all the reasons for this turn of events.

Our membership understood the original user group purchase plan to consist of the 520 ST computer, a 500K disk drive, a high resolution RGB monitor, some available software and a ROM based operating system. Members who chose to accept this offer would tender 600 dollars, beta test the system and report their findings on a regular basis. The membership was delighted with this proposal and over 100 people were ready, willing and able to accept as soon as Atari made the club an offer.

However, Atari next said that the plan would probably be to give User Groups one computer package for each ten sold. A package was understood to be as above, except for the substitution of the monochrome monitor and the package price was to be \$799.

At the June 4 meeting of our club, a straw poll showed approximately 50 members were still interested in such a package.

We are sure you can appreciate then, how disappointed these people became when they learned, moments later, that Atari's official offer was for a 520ST computer with a disk based operating system, a monochrome monitor, and a 360K disk drive for a price of \$749, after a return of \$50.

The offer caused even these people to decline acceptance. They felt insulted because they were being asked to pay the full retail price for an unfinished product and still conduct beta testing; they were disappointed because the RGB monitor was still not included; they felt cheated that the 500K floppy amounted to only 360K; and they were disgusted that there would be no guarantee of a ROM operating system upgrade when they were being asked to significantly contribute to Atari's ability to produce such a feature for the product. Additionally, they did not want 512K reduced by half with the need to keep their own operating system in RAM.

Lastly, we appreciate your offer to donate \$50 per system to the club, but since the club is in a good financial position, the members would prefer a price reduction.

It is our sincere hope that Atari has not seriously misjudged the market for the 520 ST computer. The membership of the San Leandro Computer Club consists of people from all walks of life who use many different makes of computers for hundreds of varied applications. The universal consensus of the membership, in light of the user group offer, was to wait and see the 520 ST in the retail outlets before deciding if an investment would be a wise move.

In summation, many of our members were willing to gamble on the success of the new 520 ST, but the stakes became too high when they found out they would be paying essentially full retail price for a system having so many unknowns... will it be, really, a 256K machine... how does the price compare with the machine announced in Chicago... will it even make it into general distribution?

We will be sending other User Groups a copy of this letter to encourage discussion of your offer within the Atari community.

We wish you the best of luck in your marketing endeavors and look forward to a continuing relationship.

Very truly yours,
Bob Barton, President
Jim Hood, Vice-President

cc: Mr. Sam Tramiel
Mr. Sig Hartmann
Mr. Jamie Copeland
Mr. Neil Harris

I agree whole-heartedly with most of their points and I would add the following comments:

The ST system package, consisting of the 520ST computer, single-sided micro-floppy (500K unformatted, 360K formatted) and monochrome monitor will retail for \$799. I know for a fact that a local retailer, who will remain nameless, but who advertises a great deal in our newsletter, will sell the system for \$699. The computers are scheduled to be shipped from California on July 8th and therefore should hit the local shelves within 2 weeks. Given the price, and availability, THERE IS NO INCENTIVE to buy the machines from Atari.

The new Atari Corp. is to be commended for at least trying to support User Groups and their members, especially since there has never been any kind of significant support in the past (from the old Atari). But to be frank, Atari's offer to sell the ST computer system at full retail to club members, expect them to help debug the operating system and contribute only a small amount of money to the club, is an insult to the User Group Community.

Is Atari so financially strapped that it has to make money off of User Group members like this? Is Atari so greedy that it expects club members to pay more for a system than Atari will receive from their distributors? I personally think that no offer at all would have been better than the current offer as outlined here and in the letter sent to User Group Presidents. Perhaps the new Atari has exposed their true

colors in this behavior. Promises and a lot of talk just don't make it!

Damn, I want Atari to SUCCEED! And I want an ST computer system. But what I really want is for Atari to show the same respect for their extremely loyal users that they expect be shown to them.

Let's hope that JTari will learn from this mistake and our relationship with the new Atari Corp. improves.

Arthur Leyenberger
President, Jersey Atari Computer Group

MEMO TO: Mary Russomano, JACG

FROM : Donald Forbes, JACG

SUBJECT: Forth for Highschoolers

To teach Forth to highschool students you will need the following equipments:

1. A copy of Team Atari Forth from the JACG library which will cost about \$6. Since the disk is in the public domain you may freely make as many copies as you wish.

2. You should consider spending \$27 for a copy of Steve Calfee's turbo-4th which upgrades the Team Forth to twice the speed, has a 96-page documentation manual, and will be vendor-supported. Calfee did not put his Forth in the public domain, but he is selling it at a price that any student can afford.

3. You will need a copy of the new book by Margaret A. Armstrong (\$17 from Wiley), a thirtytwo-year-old research associate at the University of California in San Diego who is currently implementing a computer literacy program for preschool children at the university's daycare center. Her book, 'Learning Forth: A Self-teaching Guide' even includes a section on how to teach children to use Forth. There are several other books that teach Forth, but this is the only one that starts from square one, has stack diagrams throughout, quizzes you after each section, concentrates on the 80 per cent of Forth that you use all the time, and ends up with a simple Payroll program that ties everything together. Here is Forth without frustration. And the programs work on the Atari, because I tried them. You will need to have all the programs on disk for your class. I thought I would save you some effort, so I put them all on a disk for you (so now you owe me a disk).

4. You should have a copy of my article that appeared in the June 1985 issue of Analog Computing magazine because that will allow you to upgrade your fig-Forth to include the vocabulary of Forth-79 and thus enable you to run a much larger selection of programs. The article is actually a commentary on Alan Winfield's book 'The Complete Forth' about Forth-79 that makes it possible for you to run all the programs on an Atari with fig-Forth. Winfield, incidentally, has built a high-speed computer in England based on Forth which is likely to be written up in the yearly Forth issue of Dr. Dobb's Journal in October.

5. When you get past Armstrong's book, you may want to tackle Winfield's book, which covers the 'complete' vocabulary of Forth-79.

6. I made a disk which can be loaded to add the Forth-79 vocabulary to the Fig-Forth vocabulary of Team Forth, and will give you a copy of it. That makes another disk that you owe me.

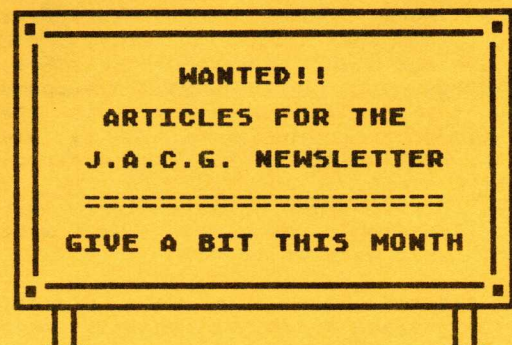
7. You should have a copy of the article I wrote for the JACG newsletter in July 84 which had a page and a half of dutch uncle advice on how to get started in Forth. Your students will be alerted to a couple of pitfalls and will be able to get up to speed without too much waste motion.

8. The people who appreciate Forth are those who have had some exposure to assembler language. I assume you have access to the Atari assembler cartridge and the manual that came with it. I believe that you should at least walk them through the manual once.

9. You will also need patience, persistence, perseverance and meticulousity because Forth is many times more powerful than BASIC but also has many more commands (or 'words') that need to be mastered. Forth is the language of machine independence. It is also an interactive language. It also runs at high speed. Debugging is easy because you test out each new command as you create it. Forth is also extensible, which means that you write programs by adding new commands to the language that do what you want them to do.

10. You should have a subscription to Forth Dimensions for \$15 a year from the Forth Interest Group, P.O. Box 8231, San Jose CA 95155 just to keep up with the news and the new publications. They have chapters around the world and you might consider forming your own student chapter. John D. Hall is the man in charge.

11. I believe W. C. Fields made the sage observation that anybody who hated dogs and children could not be all bad. Forthers worldwide feel the same about other Forthers, so do not be afraid to ask for help. People get involved with Forth not for the money but because they think they are smarter than anybody else, and they are always glad for a chance to show off. So call for help when you need it -- but don't reverse the charges!



Driving Non-Atari Printers With Atariwriter

by Frank Pazel - JACG

"In the Beginning there was Atari and only Atari. There was the 400, the 800, the 810, the 850, and the 825. It was a SYSTEM and let no man profane it by using a non-Atari component." So seemed the credo coming out of California in the early years. Furthermore, the Word in word processing was the Atari Word Processor. It was a powerful disk-based package but cumbersome to use and difficult, at best, to learn. It was designed to work directly with the Atari 820, 822, and 825 printers. Dedicated users reported twenty to thirty hours of experience before they felt comfortable with AWP. These words reached the ears at Sunnyvale, and they were sad.

To appease users a design group began work on a streamlined word processing package. It was to be as much of the original Word Processor as possible but be much easier to learn and use. It would fit in a 16K ROM. It would prove to the personal computing market that Atari was a force to be reckoned with when it came to home and business oriented software. It was called Atariwriter and it accomplished all of its technical goals. Alas, when it came to the business community it somehow missed the intended mark. The January 3, 1983 issue of Time magazine (Man/Machine of the Year issue) essentially snubbed it by saying, "...writers would do well to look elsewhere for a first-rate word processor."

Those of us using the new Atariwriter, of course, knew better. It was powerful. Very powerful. The media, conditioned to think game machine, was blind and ignorant. Within the knowledgeable Atari community the Atariwriter flourished. The more you used it the more you loved it. Its flaws were few and its features many. We talked it up and proselytized at every chance. Soon we had tens of thousands of fingers working Atariwriter. Then the problem set in.

Atari-brand printer users were tiring of limitations in speed and quality. Large numbers of new printers were turning up on showroom shelves. They produced much better looking type at a faster rate. They did graphics that we drooled over. Their costs seemed to be dropping every day. We hooked them up to our Atariwriter and cringed in horror as they turned out gibberish or less impressive work than our Atari-type printers. In the showroom they did fantastic things with other word processors. The truth was Atari had built the codes needed to format Atari printers into the ROM. Little provision had been made to use Atariwriter with anything but the official line. It seemed you had to be a post-advanced programmer to mate Atariwriter with a "foreign" machine. We were depressed. What were we to do?

The answers came from many places. Leading the onslaught for rationality were the User Groups. These dauntless types, who talk in hexadecimal codes, investigated technical manuals, dissected bit map

graphics, rearranged wiring, and generally wreaked havoc with the Atari system so the new cartridge would talk straight to the new printers. If you were a real hacker you probably stood a good chance of making your Atariwriter work with one of the new boys in town. Otherwise.....

The people at the Atari Program Exchange were not standing still. Atari knew something had to be done. The new 1020, 1025, and 1027 printers had a few problems communicating with the Atariwriter as it was. The problem wouldn't go away. APX got on the case and produced the final solution to the problem. Disk APX-20223, the Atariwriter Printer Drivers program turned the trick. It contains some fifteen binary files which act as interpreters between the Atariwriter and the specific printers. The files are named for the printers they will interpret.

Using the program is very easy. The printed instructions walk you through the menu selection process step by step. Once you have transferred the correct driver file (named after the printer to be used) to a new disk and renamed it AUTORUN.SYS the disk can be used to save files which will automatically be interpreted correctly between Atariwriter and the non-Atari printer. Most users simply load their one custom formatted disk in during the initial uploading of Atariwriter. Once the formatting file has done its work it isn't needed again during that writing session. A small warning. Don't expect every Atariwriter function to work perfectly using this program. The translator for some printers has problems. For example, CTRL U does not provide underlining on the Epson RX printer. There are other minor problems with other printers but they are correctable as you will see shortly. The best advice is to try the code prescribed for the Atariwriter in the manual. If it doesn't work you will either have to do without it or imbed the code yourself.

The availability of the Atariwriter Printer Drivers program in retail outlets is limited due to cutbacks in personnel and the lack of an independent APX division within the Atari organization. It still can be found on some dealer's shelves but supplies are rapidly dwindling. The program can be ordered directly from Atari by writing APX, c/o Atari Customer Service, 1312 Crossman Avenue, Sunnyvale, CA 94088. They will send you a complete list of APX available titles and a special order form. Using the new form expedites handling which can be as short as a few days. If you use the old form from the APX catalogs it can take many weeks to have your order filled. Another source for programs which will do exactly the same job is At-A-Glance, 86 Ridgedale Avenue, Cedar Knolls, NJ 07927. They produce individual interpreter disks called Printer Formatted Data Disks for a wide range of printers. Each disk contains the decimal code to format a specific printer with a DOS 2.0 version on one side and DOS 3.0 version on the other. Price of each disk is \$14.95, including shipping.

Another solution to the problem of printer formatting lies within the structure

of Atariwriter. Page 43 of the manual tells you how to enter those needed special codes for other printers. It does this in 108 words which leave most users frustrated and angry. You are instructed to format your text files by "entering the desired printer controls directly in your files" by typing in CTRL Q followed by the "decimal equivalent of the appropriate hexadecimal code understood by your printer. You should be able to find a listing of hexadecimal codes and decimal equivalents in the manual that came with your printer." Now, the intentions of this manual writer were, I am sure, entirely honorable. The words, however, give most owners of Atariwriter little idea of what they actually have to do.

Your task is not that difficult but does require an organized approach. Each printer manual does, indeed, have a listing of printer commands which cause certain kinds of fonts to appear or printer operations to occur. If you want to make your Atariwriter talk to your printer you have to determine what specific decimal command you need. Most manuals will give you a table listing the plain language command [compressed pitch], a description of what it does [sets print to 17 cpi compressed pitch], and the general and BASIC format for inserting the command in the text file [ESC Q or CHR\$(27);CHR\$(81)]. These codes are from the Prowriter(tm) manual and are used as an example.

Using this information you could produce compressed pitch printing with your computer by typing within the text file, immediately before that point where you want the printing to occur, a CTRL Q followed by 27, another CTRL Q followed by 81. On the Atariwriter screen it would look like this:

Q27Q81

The explanation for this sequence is found by looking up the decimal codes in a table. A good source is Appendix D, "Codes, Characters, and Keystrokes" in Your Atari Computer by Lon Poole, et al. You will find that decimal code 27 is the same as pressing the ESCape key and that decimal code 81 is the same as typing in a letter Q. The printer, therefore, receives the prescribed ESC Q formatting code to start producing compressed type. The use of the CTRL Q as a preface to each number alerts Atariwriter to accept printer control codes in decimal form and to send them over the I/O bus to the printer.

The following table lists the formatting codes which produce condensed print with several printers. Use it as a model when deciphering the specific numbers needed for your printer. Locate the desired code in your manual and follow the format presented below:

Codes To Produce Condensed Print With Atariwriter

PRINTER	GENERAL FORMAT	TYPE IN ATARIWRITER *
EPSON (ALL MODELS)	CTRL Q	Q15
PROWRITER	ESC Q	Q27Q81
GEMINI 10X/15X	ESC B CTRL C	Q27Q66Q3
PANASONIC 1090/1091	CTRL Q	Q15
MICROGRAPHIC (BMC)	CTRL Q CTRL R	Q15Q18
OKIDATA MICROLINE 92/93	CTRL =	Q29

* Q means hold down the CTRL key while typing Q.

It's that simple and that complex. Making your printer behave the way you want it to will require a little bit of research and analysis on your part. Certain printers may not respond exactly as you want them to the first time. Unfortunately it is a fact of life that errors creep into manuals. The production line machines often change considerably from the prototypes used to develop the instructions, adding to your chore. Don't be afraid to experiment with your printer codes. You may have some disappointments but you will have many successes. You certainly can't do any harm. In any event, you can now hitch your Atariwriter to any printer and with just a little bit of work produce exactly what you want to see. Maybe it's time for all of us to write a much-belated Atariwriter letter to the Editor of Time magazine?

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GIVE A BIT!!!

GIVE A BIT!!!

GIVE A BIT!!!

Byte-sized Programming

by Tom Pazel - JAGG

As promised, this month I will be covering the CIO. Much like my earlier columns on ANTIC and the display list, the CIO has been quite thoroughly handled in ANTIC, ANALOG and the like. In the same way that understanding display lists and the ANTIC chip give you a good background on the graphics ability of your ATARI, understanding the CIO is the key to knowing how practically all Input/Output is done. This includes printing on the screen, reading and writing to the disk, printer, modem, etc.

Though I am definitely NOT a hardware person, I think it is beneficial to our discussion to start by (re)learning about the hardware/software interrelationships of our computers. The "core" of your computer is the OS (Operating System). Without that little beauty in our machines, they would be nothing and could do nothing. It is sometimes called the "personality board" because it really is just that. It gives our ATARIs the character/personality which makes them different from an APPLE or IBM. The OS scares people because it just sounds awfully complicated. Don't be afraid, the OS won't bite. The OS is nothing more than a machine language program placed in ROM that is tied to the operation of the entire computer. Just what the heck does the OS do, anyway? Well, it knows how to boot disk drive 1, print data on the screen or printer, read any sector from disk, see if a key is being pressed, to name a few. The point I am making here is that your whole computer system relies on that thing we call the OS.

In order to get a better understanding of what is to follow, it is imperative to talk about something that is called the Handler Address Table (HAT). None of the peripherals (disk drive, printer, etc.) that you have connected to your ATARI have the ability in and of themselves to do any of the wonderful things they do. At least, not without help. This help is in the form of software. Specifically, OS software. More specifically, OS device handler routines. Without going into the bits and bytes of the matter, the OS has routines that "drive" or "handle" these devices (through something known as SIO, which we'll talk about later); hence the name Device Handler. In order to make ATARI I/O more general and to allow for customization of the handlers, these routines are referenced by a table in RAM called the Handler Address Table. There is one entry in the HAT for each device available to the computer. By default, you are given five (5) devices no matter what "real" devices are attached. They are as follows:

Device Name	Actual Device
K	Keyboard
S	Screen
E	Editor
P	Printer
C	Cassette

Whenever you write OPEN #1,4,0,"K:", your ATARI must, at some point, search through the HAT to find the "K" device in order to go to the correct device handler routine to carry out your request. That's what the HAT is for. It tells the 6502 where the heck the routine is that will provide a program access to a device.

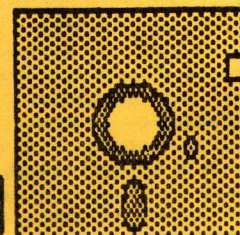
I've thrown an awful lot at you in one short article and in keeping with the name of the column, I believe I'll break here. The better you understand this month's column, the easier it will be to grasp next month's. We'll start right in with the actual use of CIO next time. Until then, remember:

How many programmers does it take to change a light bulb?

None. It's a hardware problem.

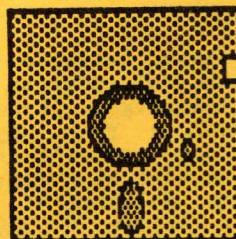
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DOCUMENTED VENDOR-SUPPORTED FORTH
FOR ATARI AT GIVE-AWAY PRICE
by Donald Forbes - JACG

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884 Cape Diamond Drive
San Jose, California 95133
On bended knee, gaze skyward.

Your prayers have been answered!
Steve Calfee, who wrote the public domain Team Atari Forth, has souped it up to run twice as fast, has written a 96-page manual, and promises to support it. Here is Steve's announcement:

I have been a Forth fan for many years, and have done Fig-compatible implementations for many different processors. I worked for Atari for very close to 8 years, and washed out with the other VPs when Tramiel bought the company. But enough about me. Let me tell you about my latest project, turbo-4th.

Over the past couple of years I have experimented with doing the fastest possible implementation on several processors, maximizing the quirks of each processor. I developed a 6502 version which is running on the Atari computers, it is Fig- and Team Forth compatible, and from two to four times faster! I have been using it intensively, and decided to unleash it on the world.

One of the big drawbacks to Team Forth is inadequate documentation and support. But it is cheap. Forth is not a popular language on home computers, for many reasons, but primarily because most people have not been exposed to it. A reliable, documented, and inexpensive Forth program is also needed.

I tried to get some existing software manufacturers to market this program, but they wanted to sell it for \$150, and estimated that the total market would be around 100 units. I would rather see more people use and enjoy Forth. Anyway, for that small a market, I decided I could distribute it easily myself.

Pricing software is difficult, but luckily I am not trying to pay for development or support myself on sales. I decided to charge enough to cover materials with a small profit for the trouble of publishing and most importantly supporting the program. So I decided to charge \$25 plus postage (and sales tax for Californians). It is my intention to answer user mail to help with problems, and to maintain a mailing list to announce bug fixes in the program or manual. I will also announce new versions and applications. If there are enough sales and interest in turbo-4th, I might open a computer bulletin board for turbo-4th support and information sharing.

I hope you will enjoy and use turbo-4th as much as I do.

Calfee's system diskette can be copied for backup. His manual includes complete documentation of all the screens, including

Atari graphics and I/O. Here is a list of the included utility programs:

- 1 Atari system calls for graphics, audio, and I/O routines
- 2 Memory dump/patch utility
- 3 Source code screen and line editor
- 4 Macro assembler
- 5 Decompiler/disassembler
- 6 Display list disassembler
- 7 Full time stack display
- 8 Lineprinter listing program
- 9 Two prettyprinting and documentation programs
- 10 Disk formatting
- 11 Program to write bootable application programs
- 12 Complete string routines including arrays of strings
- 13 Glossary generator utility
- 14 Fig-Forth benchmarks for comparing execution speeds

"All things come to him who waits -- long enough!!"

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More Advanced Atari Music

by Mark Knutsen - JACG

After reading Matthew Tomlinson's article, "Advanced Songs on the Atari," in the May newsletter, I felt that I, too, must air my views on music and music programming on the Atari home computers.

The Atari owner who wants to program music has many options available to him. Since Atari BASIC contains the very versatile SOUND statement, (something the Commodore owner lacks,) the most obvious modus operandi is to "do it in BASIC." This, however, is not the easiest way to go. Canned software programs can make music creation easy, and even pleasant. More on this later.

More than two years ago, when I first bought my trusty 800, I had no money left for expensive extras like disk drives and software. When I decided to program music, I did it in BASIC. This proved to be an educational experience. Also, the music that I created could be incorporated into my BASIC programs, something that is hard to do with commercial music software. (Except with the POKEY Player, again, more on that later.) I encourage those of you who have knowledge of BASIC and music theory to combine that knowledge and program some music in BASIC. You will gain more experience in and comfort with BASIC, (that extra comma in the DATA statement throws everything off...) and hone your "rhythm skills." (How do you program eighth notes over a triplet?)

In the interest of provoking experimentation, I would like to present my method of BASIC music programming as opposed to Matthew Tomlinson's. Witness "Chariots of Fire," programmed in four-part harmony straight from the sheet music. In this program, the loop in lines 70-90 does all the work. First, five numbers are READ. The first four are note values, and the fifth is the length (L) relative to the piece's tempo (T), which is set (T=160) in line 60. The delay (D) before the next set of notes are played is equal to T times L. For example, if a quarter note (my "standard length" note) is to be played, L will be 1, and D will be 160 times 1, or 160. If an eighth note (which is one half the length of a quarter note) is to be played, L will be .5, and D will be 160 times .5, or 80. The delay loop will be shorter, thus the note will be held for a shorter length of time.

The advantage of this method is that very long chords can be specified using only five numbers. The first chord of "Chariots of Fire" is to be held for twelve beats. Thus the first five numbers in the first DATA statement are 230, 153, 114, 91, and 12. Also, this method allows me to program notes with weird lengths (one note of a triplet has a length of about .65), and very short rests. A very short break in all four voices is "0,0,0,0,.001". Be careful to distinguish commas from decimal points.

This program allows for tempo changes, also, by checking for a note length of zero and then reading a new tempo. To add a sudden tempo change to "Chariots," add the following line:

```
145 DATA 0,0,0,0,0,80
```

to the program and reRUN. The program ends when it encounters six zeros in a row (see line 520).

One more interesting note (pun not intended) before we move on: In the process of prettying up "Chariots" for newsletter presentation, I changed the "title page" from GRAPHICS 0 to GRAPHICS 2. When I ran the program, I noticed a slight increase in the music's tempo. This is due to the smaller amount of memory that the ATARI has to manage in order to generate a GRAPHICS 2 screen. Thus, Rule #1: If you want speedier processing, have your BASIC program use a GRAPHICS mode that requires a small amount of memory, like GRAPHICS 2 or GRAPHICS 3. Alternatively, you can turn off the ANTIC display chip entirely, (POKE 559,0) blanking the screen and speeding things up even more. Just make sure that you PEEK 559 first to find out what number (usually 34) to POKE there when you want your display back. For example, add these lines to "Chariots" to turn off the display while the song is being played:

```
55 DISPLAY=PEEK(559):POKE 559,0
999 POKE 559,DISPLAY:END
```

Did you notice a slight speed increase?

If you want to bypass all these technical contortions and just get down to programming music, you should consider a commercial music composing program. My favorite is the Advanced Musicsystem by Lee Actor. The Atari Program Exchange sold this excellent program way back when, and its "piano keyboard display" while playing songs caught my eye. Entering music using this program is extremely easy. My only gripe with it is that the EDIT mode is slow to display existing measures, and the EDIT cursor is also too slow. Hopefully the new Advanced Musicsystem II (available from LotsaBytes) is faster in these regards.

The POKEY player (JACG library disk #42) is another good music composing program. This one comes with 40 demonstration tunes, and can play music while your BASIC program is running! Unlike AMS, the POKEY player will not let you hear the music you are entering/editing. The music must first be compiled by a separate program. The process of entering music, compiling it, isolating errors, and going back to the editor is a bit cumbersome.

You can make your enjoyment of ATARI music greater if you connect your computer to your stereo. If your ATARI has a monitor jack, buy a monitor cable (under \$10) and attach the correct RCA plug to your amplifier's input jack. If necessary, buy a Y-adaptor to split the signal and send it to both speakers. The results are superb.

With the coming of MIDI interfaces and better music programs (like Virtuoso, from the June meeting), the future of music programming on the ATARI looks very bright. In the meantime, if you would like to contact me regarding ATARI music, to swap ideas, AMS files, or programs (BASIC or FORTH), write or call me before July 28th at the address in the drum, below. I'm waiting to hear from you!

```

10 GRAPHICS 2:POKE 710,0:POKE 709,15:POKE 752,1
20 POSITION 6,3: ? #6;"CHARIOTS"
30 ? #6;"      OF"
40 ? #6;"      FIRE"
50 ? : ? "Programmed by M. Knutsen & J. Garcia"
60 T=160
70 READ N0,N1,N2,N3,L:IF L=0 THEN READ T:IF T=0 THEN GRAPHICS 0:GOTO 999
80 SOUND 0,N0,10,4:SOUND 1,N1,10,4:SOUND 2,N2,10,4:SOUND 3,N3,10,4
90 FOR D=0 TO T*L:NEXT D:GOTO 70
100 DATA 230,153,114,91,12,230,136,114,85,3,230,114,0,0,2,0,0,0,0,0,001,230,153,114,76,13
110 DATA 230,57,0,0,1,230,68,57,42,.65,230,37,0,0,.65,230,33,0,0,.65,230,76,57,37,2,230,76,57,45,3
120 DATA 230,57,0,0,1,230,68,57,42,.65,230,37,0,0,.65,230,33,0,0,.65,230,76,57,37,5
130 DATA 230,57,0,0,1,230,68,57,42,.65,230,37,0,0,.65,230,33,0,0,.65,230,76,57,37,2,230,76,57,45,3
140 DATA 230,45,0,0,1,153,85,68,42,.65,153,45,0,0,.65,153,57,0,0,.65,230,114,91,57,5
150 DATA 230,57,0,0,1,230,68,57,42,.65,230,37,0,0,.65,230,33,0,0,.65,230,76,57,37,2,230,76,57,45,3
160 DATA 230,57,0,0,1,230,68,57,42,.65,230,37,0,0,.65,230,33,0,0,.65,230,76,57,37,5
170 DATA 230,57,0,0,1,230,68,57,42,.65,230,37,0,0,.65,230,33,0,0,.65,230,76,57,37,2,230,76,57,45,3
180 DATA 230,45,0,0,1,153,85,68,42,.65,153,45,0,0,.65,153,57,0,0,.65,230,114,91,57,4.5
190 DATA 153,114,91,57,.5,230,57,45,27,.5,182,57,45,27,.5
200 DATA 153,60,37,29,.65,68,33,0,0,.65,91,76,37,0,.65
210 DATA 182,60,37,29,.5,243,60,37,29,.5,153,60,37,29,.5,153,37,0,0,.5
220 DATA 173,68,42,33,.5,230,68,42,33,.5,136,68,42,33,.5,136,42,0,0,.5
230 DATA 230,76,45,37,.5,153,76,45,37,.5,230,76,45,37,.5
240 DATA 182,57,45,27,.5
250 DATA 153,60,37,29,.65,68,33,0,0,.65,91,76,37,0,.65
260 DATA 182,60,37,29,.5,243,60,37,29,.5,153,60,37,29,1,173,153,121,85,2,230,153,114,91,1
270 DATA 230,57,45,27,.5,182,57,45,27,.5
280 DATA 153,60,37,29,.65,68,33,0,0,.65,91,76,37,0,.65
290 DATA 182,60,37,29,.5,243,60,37,29,.5,153,60,37,29,.5,153,37,0,0,.5
300 DATA 173,68,42,33,.5,230,68,42,33,.5,136,68,42,33,.5,136,42,0,0,.5
310 DATA 230,76,45,37,.5,153,76,45,37,.5,230,76,45,37,.5
320 DATA 182,45,0,0,.5,173,85,68,42,.65,85,45,0,0,.65,173,114,57,0,.65
330 DATA 230,114,91,57,.5,182,114,91,57,.5,230,114,91,57,.5,182,114,91,57,.5
340 DATA 153,114,91,57,.5,182,114,91,57,.5,230,114,91,57,.5,182,114,91,57,.5
350 DATA 230,114,91,57,.5,182,114,91,57,.5
360 DATA 230,57,45,27,.5,182,57,45,27,.5
370 DATA 153,60,37,29,.65,68,33,0,0,.65,91,76,37,0,.65
380 DATA 182,60,37,29,.5,243,60,37,29,.5,153,60,37,29,.5,153,37,0,0,.5
390 DATA 173,68,42,33,.5,230,68,42,33,.5,136,68,42,33,.5,136,42,0,0,.5
400 DATA 230,76,45,37,.5,153,76,45,37,.5,230,76,45,37,.5
410 DATA 182,57,45,27,.5
420 DATA 153,60,37,29,.65,68,33,0,0,.65,91,76,37,0,.65
430 DATA 182,60,37,29,.5,243,60,37,29,.5,153,60,37,29,1,173,153,121,85,2,230,153,114,91,1
440 DATA 230,57,45,27,.5,182,57,45,27,.5
450 DATA 153,60,37,29,.65,68,33,0,0,.65,91,76,37,0,.65
460 DATA 182,60,37,29,.5,243,60,37,29,.5,153,60,37,29,.5,153,37,0,0,.5
470 DATA 173,68,42,33,.5,230,68,42,33,.5,136,68,42,33,.5,136,42,0,0,.5
480 DATA 230,76,45,37,.5,153,76,45,37,.5,230,76,45,37,.5
490 DATA 182,45,0,0,.5,173,85,68,42,.65,85,45,0,0,.65,173,114,57,0,.65
500 DATA 230,114,91,57,.5,182,114,91,57,.5,230,114,91,57,.5,182,114,91,57,.5
510 DATA 153,114,91,57,1,182,114,91,57,1,230,153,114,91,8
520 DATA 0,0,0,0,0
999 END

```



VICTORY AT SUNNYVALE

by Donald Forbes - JACG

Four pairs and seven years ago Charles Moore brought FORTH to this continent, a new language conceived in liberty and dedicated to the proposition that all computers are created equal.

Now we are engaged in a most uncivil war, testing whether that language or any language so conceived and so dedicated can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of this newsletter as a final restingplace for those writings that here gave their ink that that language might live. It is altogether fitting and proper that we should do this.

But, in a larger sense, we cannot dedicate -- we cannot consecrate -- we cannot hallow -- this groundwood. The brave men, living and dedicated, who struggled here have consecrated it far above our poor power to add or subtract. The world will little note nor long remember what we say here, but it can never forget what they wrote here. It is for us, the living, rather, to be dedicated here to the unfinished work which they who wrote here have thus far so nobly advanced.

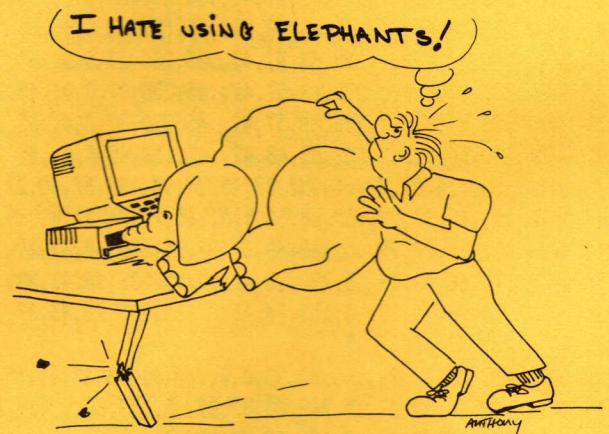
It is rather for us to be here dedicated to the great task remaining before us -- that from these honored scribes we take increased devotion to that cause for which they gave the last full measure of devotion; that we here highly resolve that these scribes shall not have penned in vain; that this language, by God!, shall have a new birth of freedom; and that computing of the people, by the people, for the people, shall not perish from the earth.

Koala Pad Music

by Don Krell - Redwood, CA Atari Group

This little BASIC program translates input from a KOALA PAD into sound, and displays the stylus position on the KOALA PAD as a dot on the screen for each note. The dots remain on the screen until you press a KOALA PAD button. The program should also work for paddles. Try it for some interesting audio and visual effects. (Ed. note- I tried this program with the Atari Touch Tablet and with minor modifications it works fine.)

```
10 GRAPHICS 23
20 S=PADDLE(1)-3
30 SOUND 0,S,10,10
40 COLOR INT(S/(S+1)+0.5)
50 PLOT PADDLE(0)*0.69,PADDLE(1)*0.41
60 IF PTRIG(0) AND PTRIG(1) THEN 20
70 GOTO 10
```



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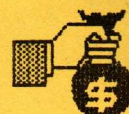
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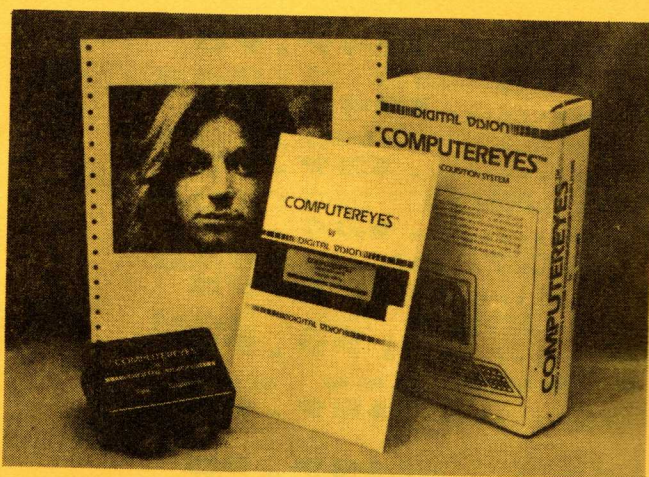
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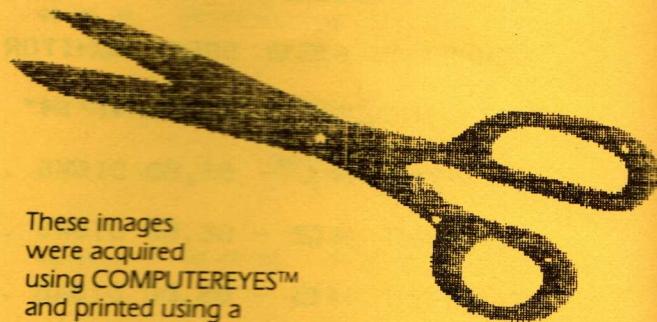
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Getting Down to BASICS by Richard Kushner - JACG

I have written a column for the JACG newsletter for as long as there has been a JACG. All I ever asked for was some feedback and requests for suggested topics to cover in later columns. Now I am asking for something more. I am involved in a project that could be greatly helped by JACG members and others who read our newsletter. I am looking for computer humor; jokes, cartoons, bumper sticker sayings, etc. These can be originals or things you have gotten from other places. My interest is not limited to Atari humor. I am asking that you send all items to me in the mail, with a note as to where the original came from if you know. Send all contributions to:

Richard Kushner
58 Dewey Avenue
High Bridge, NJ 08829

Please help me out on this.

Now back to BASICS once again. I took a month off from this column last month, since other things that had to be done left no time for this effort. But now, it's back to an assortment of "goodies", short programs in Atari BASIC that may be useful, educational or entertaining.

From the United Kingdom Atari Computer Owners Club comes a program to add thin black lines in between the lines of text on a graphics zero screen. Graphics zero is the mode that regular text uses. I don't know how useful this routine is, but it is interesting to play with. What the following program does is modify the "display list" which is just a way of saying that we will modify the program that controls what graphics modes are used and how the screen is displayed. The way to use this program is to make it a subroutine, which only needs to be executed once. To remove the lines, just use POKE 561, OLD. To once again produce the lines use POKE 561, OLD-1.

```
5 REM.... Generate Lines on Screen ...
10 OLD=PEEK(561):DL=PEEK(560)+256*OLD
20 DL1=DL-256
30 FOR A=1 TO 6
40 POKE DL1+A,PEEK(DL+A):NEXT A
50 FOR A=6 TO 50 STEP 2
60 POKE DL1+A,0:POKE DL1+1+A,2:NEXT A
70 FOR A=52 TO 53
80 POKE DL1+A,PEEK(DL+A-23):NEXT A
90 POKE DL1+54,PEEK(561)-1
100 POKE 561,OLD-1
```

From the ACE group of Sidney, Australia comes the next short program that plots polygons (multisided shapes). Some sample inputs you might try are: circle (70,7); square (4,100); triangle (3,100); hexagon (6,70); octagon (8,65); pentagon (5,80).

```
10 PI=3.14159265
20 GRAPHICS 0:POKE 710,0
30 ??:POKE 764,255
40 TRAP 40:? "HOW MANY SIDES";:INPUT N
50 TRAP 50:? "SIDE LENGTH";:INPUT L
60 K=2*PI/N:R=0
70 GRAPHICS 8+16:POKE 710,0:COLOR 1
80 X=120:Y=80:PLOT X,Y
90 TRAP 200
100 FOR I=1 TO N
110 X=X+L*SIN(R)
120 Y=Y+L*COS(R)
130 DRAWTO X,Y
140 R=R+K
150 NEXT I
160 FOR WAIT=1 TO 1000:NEXT WAIT
170 GRAPHICS 8+32:POKE 710,0:POKE 752,1
180 ??: "PRESS ANY KEY TO CONTINUE":POKE
764,255
190 RUN
200 GRAPHICS 0:POKE 710,0
210 ??: "YOUR LENGTH WAS TOO LONG FOR THE"
220 ? "NUMBER OF SIDES REQUESTED!": GOTO 30
```

Finally, from the Jersey Atari Computer Society, comes a useful program for slow scrolling. You will find it useful when editing programs, since you control the line-by-line listing. You make the program scroll forward or in reverse by using the SELECT or OPTION keys. To use the program, first type it in and then LIST it to disk or tape. Be sure NOT to use lines numbers 0 to 7 in your own program! Then you can ENTER the program and it will be at the start of any program you are working on. It provides "on screen" instructions regarding the use of the SELECT and OPTION keys. Another very useful, short program.

```
0 POKE 710,2:? "START:":INPUT L:? "END":INPUT
E:? CHR$(125):?:?
1 ? "PRESS <SELECT> TO SCROLL FORWARD":? "
<OPTION> TO SCROLL REVERSE":?:?
2 LIST L: IF L=0 THEN L=1:LIST L
3 IF L=E THEN END
4 IF PEEK(53279)=7 THEN 3
5 IF PEEK(53279)=3 THEN L=L-1:GOTO 2
6 IF PEEK(53279)=5 THEN L=L+1:GOTO 2
7 IF PEEK(53279)=<>3 OR PEEK(53279)=<>5 THEN 3
```

This program begins by turning the screen red(POKE 710,2) and then requesting a starting and ending line number for the listing. It then reminds you which keys to use to scroll forward and reverse. It then lists the first line requested, checking to be sure that it is not line 0 or less. Then it checks which key is pressed (SELECT or OPTION) and uses this information to decide whether to print the previous line or the next line. Finally, if a wrong key is pressed, it goes back and waits for an appropriate key to be touched. There is nothing particularly complicated or magical about this program, but that does not detract from its usefulness.

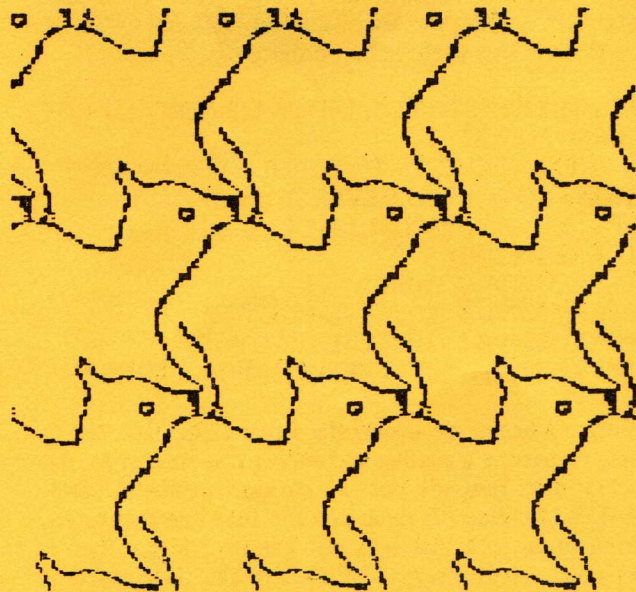
Next month, a new topic. Until then, remember to send me any computer humor you run across. I really would appreciate it.

ESCHER SKETCH by Kirk McDonald - JACG

Did you know that there are 17 different kinds of wallpaper? That is, the mathematicians tell us that there are 17 ways an image can be repeated regularly to fill up a blank wall. This peculiar fact has been utilized by artists to produce intriguing decoration, and at best, compelling works of graphic art. The most famous examples are the drawings of M.C. Escher. (See "The World of M.C. Escher" published by Abrams, Inc. (1971) for an extensive collection of his work.)

You can try your hand at designing all 17 kinds of wallpaper with the program ESCHER SKETCH which runs on a 48K Atari computer. Use a joystick or Koala Pad to sketch an image and the computer will replicate it 6 or 8 times on your TV screen. Then you can save it to disk in Micropainter format, and/or dump it to an Epson FX-80 printer. The disk file can then be read in by Micropainter or MicroIllustrator if you want to add color.

The program is available on a JACG library diskette in either binary form, ESCHER.COM, or as an Action! text file ESCHER.ACT. An instruction manual is included on the file ESCHER.DOC. The program is based on an article by Edward H. Carlson which appeared in the May 1985 issue of Creative Computing magazine. (Another program based on the imagery of Escher appeared in the August 1983 issue of Antic magazine.)



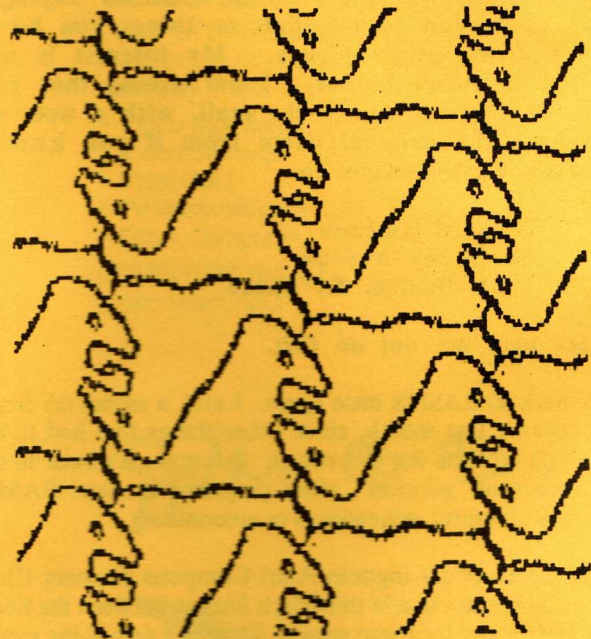
Symmetry 1 - Prairie Dogs

The figures show my attempts to draw interlocking animal images in the 17 possible ways. Symmetry H yielded only rather crystalline patterns--perhaps you will be more successful. I used symmetries 8 and 6 to illustrate another amusing aspect of the program: patterns which could be implemented with floor tiles. The fascinating subject of "tessalation" has been explored by Martin Gardner in the July

and August 1975 issues of Scientific American.

If you develop a more technical interest in why there are 17 kinds of wallpaper you might peruse the book "Symmetry in Art and Science" by Shubnikov and Koptsik (Plenum Press, 1974).

In any case, the program is quite easy to use, and certainly does not require deep understanding of the geometry it is based on. No great art has ever been created by a mathematician!



Symmetry 2 - Dinos



Symmetry 3 - Mutt and Jeff



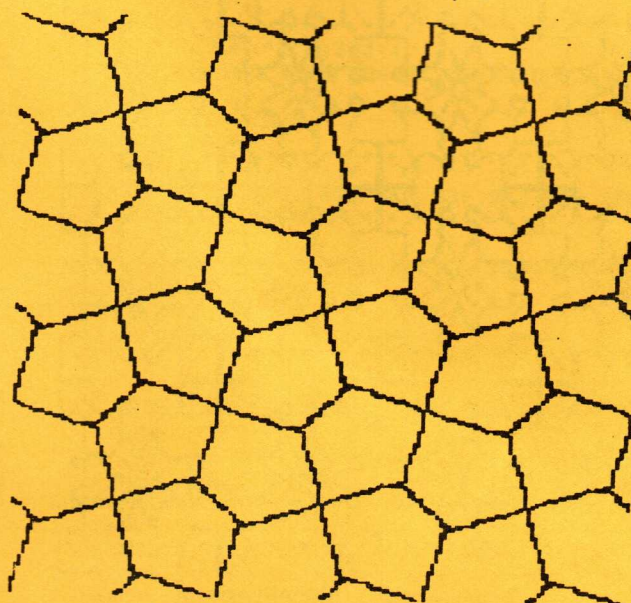
Symmetry 4 - Ducklings



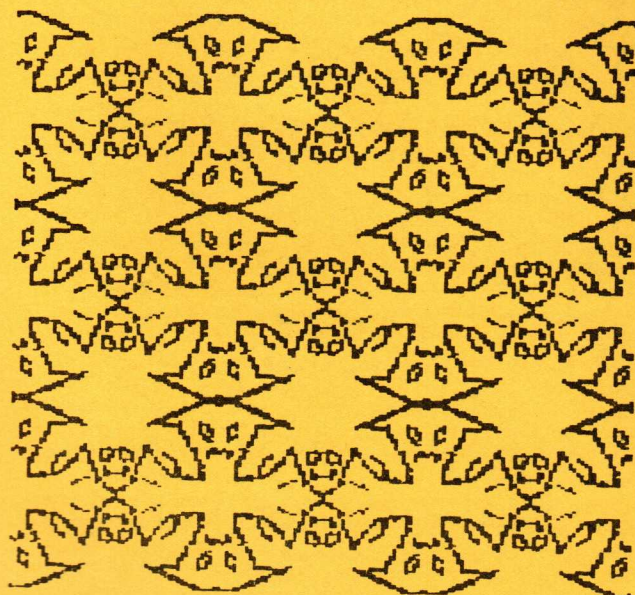
Symmetry 7 - Bee People



Symmetry 5 - E.T.



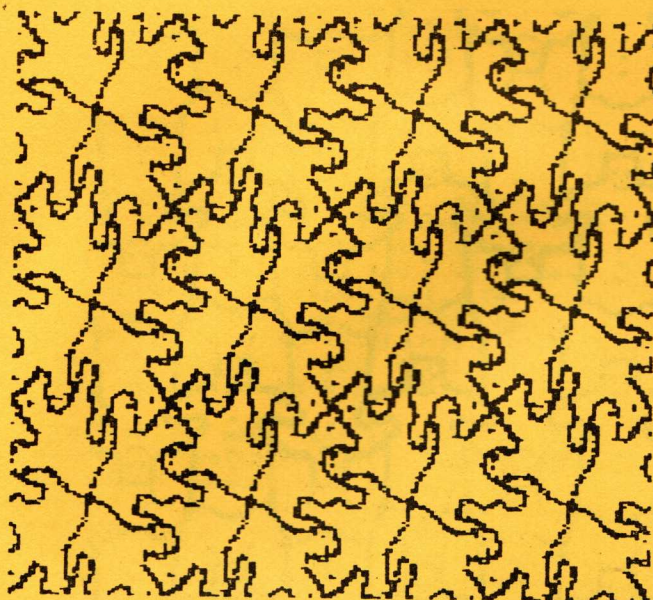
Symmetry 8 - Cairo Tiles



Symmetry 6 - Double Headers



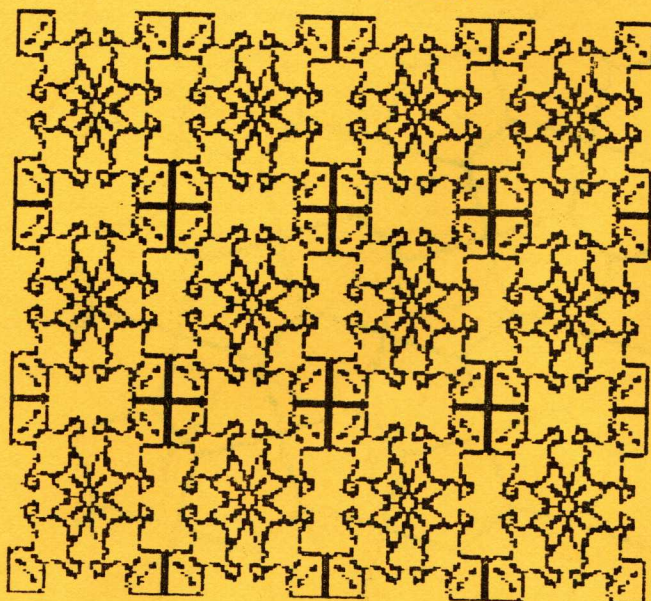
Symmetry 9 - Wombats



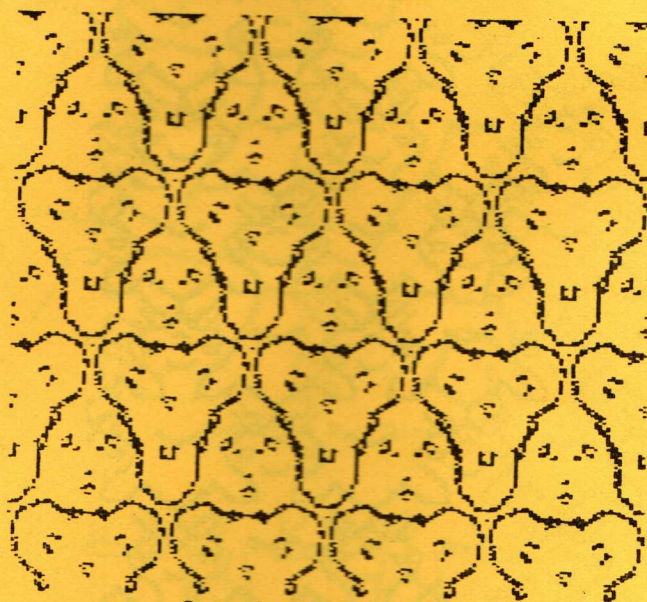
Symmetry A - Horsemen



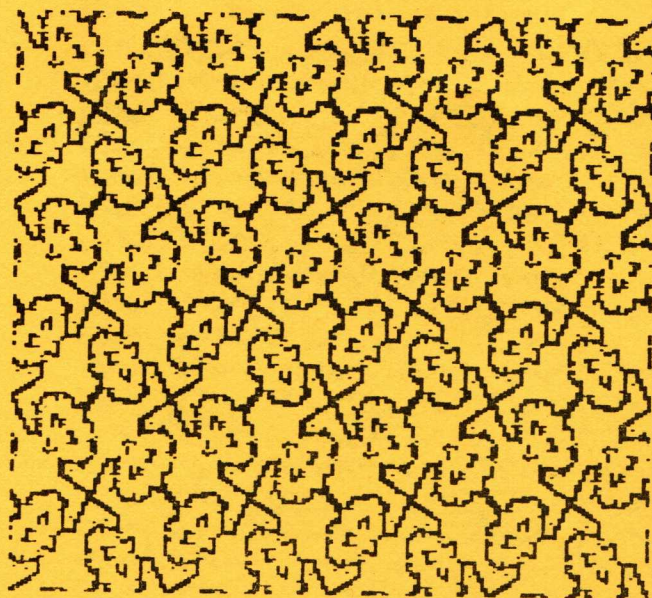
Symmetry D - Ghosts



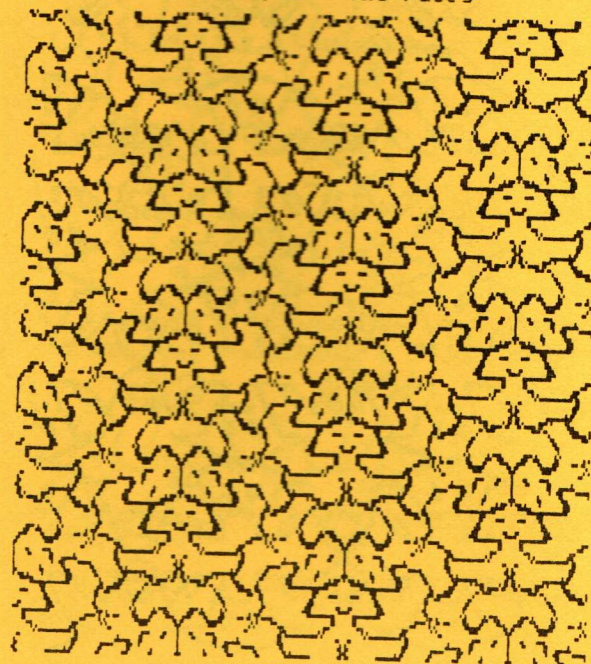
Symmetry B - Coneheads



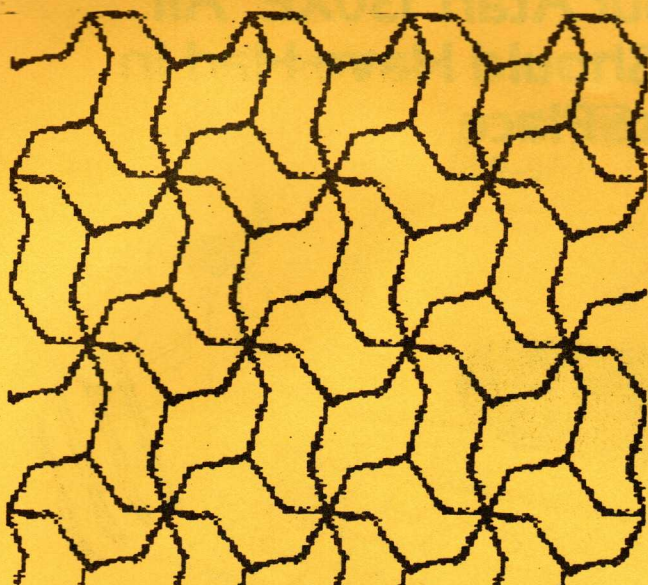
Symmetry E - Two Faces



Symmetry C - Owls



Symmetry F - China Dolls



Symmetry G - Alhambra Tiles



Symmetry H - Snowflakes

FASCINATING 153

by Kenneth J. Pietrucha - JACG

One of the interesting things about playing with numbers is the things that are discovered along the way. None of the things I am about to tell you happened "One day as I sat down at my computer", or over any special time period, they just happened.

Take for example, the first time I discovered Narsistic or Armstrong numbers. Briefly, these are numbers where the sum of the cubes of the individual digits is equal to the original number. As an example, take the number 153, the first of the Armstrong numbers, and the star of the show. If we take 1 cubed plus 5 cubed plus 3 cubed, we get $1 + 125 + 27 = 153$, which is our original number. This in itself is not very earth shattering. As a matter of fact, like prime numbers, Armstrong numbers are often used as programming exercises. Since 153 is the first of these numbers, it is easily remembered.

A variation of Narsistic numbers is that if you add the cubes of the digits of any number that is a multiple of three, and keep repeating the process on the answer, you will eventually reach the number 153.

Here is the program I wrote to test this conjecture. If you have a printer, remove the REM statements from the beginning of line 5 and line 160.

```

1 REM MULTIPLES OF THREE EVENTUALLY
2 REM REACH 153 WHEN SUM OF CUBES
3 REM ARE CHAINED.
4 REM KENNETH J. PIETRUCHA--5/28/85
5 REM POKE 838,166:POKE 839,238:REM SEND
  RUN TO PRINTER
9 DIM A$(5)
10 FOR T=100 TO 1000
20 IF T/3<>INT(T/3) THEN GOTO 150
25 LET X=T
30 A$=STR$(X)
40 LA=LEN(A$)
50 FOR N=1 TO LA
60 B=VAL(A$(N,N))
70 C=B*B*B
80 SUM=SUM+C
90 NEXT N
100 PRINT SUM;" ";Z=Z+1
110 IF SUM=153 THEN GOSUB 200:GOTO 150
120 X=SUM
130 SUM=0:C=0:B=0
140 GOTO 30
150 NEXT T
160 REM POKE 838,163:POKE 839,246:REM SEND
  RUN BACK TO SCREEN
200 PRINT
201 PRINT T;" = 153 IN ";Z;" ITERATIONS"
202 Z=0:SUM=0:C=0:B=0
205 PRINT :PRINT
210 RETURN

```

Some where along the way, it was pointed out that $5! + 4! + 3! + 2! + 1! = 153$. The symbol ! stands for factorial, which represents the product of all the numbers descending from the given number to 1 (ex. $5*4*3*2*1=120$). The sum of the factorials from 5! to 1! is equal to $120 + 24 + 6 + 1 = 153$. Interesting, isn't it ? Perhaps, but nothing to write home about.

Some one else came along and pointed out the number 153 is equal to the sum of all the numbers between 1 and 17 (a triangular number).

The number 153 is also mentioned in the bible. In John (21:11), Jesus and his disciples went fishing on the Sea of Tiberias. When they hauled in the catch, your guessed it, 153 fish !

Did John know of the peculiarities of the number 153 when he wrote the gospels ? Most of the time the bible uses round numbers like 100 or 1000, so if you see a number like 153, you can be sure it has some special significance. Remember, these people didn't have computers, so the solution must be simple.

What about the computer age ? How does the number 153 fit in ? Well, if we take the ASCII sum of the individual digits, we get $49 + 53 + 51$ which, believe it or not, equals 153.

If anyone knows any other facts concerning the number 153, I would appreciate your sharing them with me.

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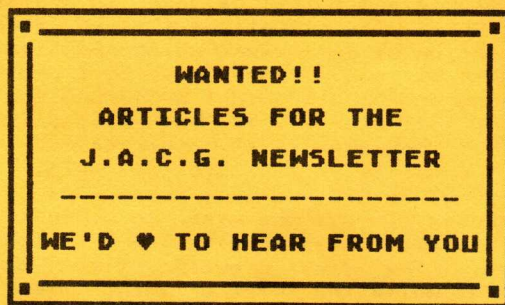
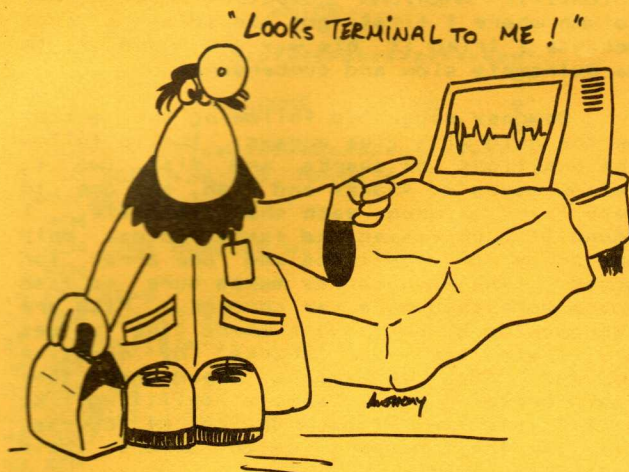
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PEEKs AND POKEs
by Kenneth J. Pietrucha - JACG

Although not officially a Peek/Poke location, the joystick ports can be read in almost the same manner. On older 800 machines, there are four ports numbered 0 through 3, while the newer XL's have two ports, 0 and 1. The position of the joystick is read using the form STICK (#) where # is the port to be read.

The fire button on the other hand, is read with the form STRIG (#). To see what I mean, run this short program with the joystick plugged into the first port, or STICK (0).

```
5 GRAPHICS 0
10 IF STICK (0)<>15 THEN PRINT STICK (0)
15 FOR DELAY=1 TO 100:NEXT DELAY
20 IF STRIG(0)<>1 THEN PRINT "BOOM"
30 GOTO 10
```

Note that the default value of the stick is a value of 15 when the stick is straight up, while the default for the fire-button is 1.

When the program is run with the joystick in port 0, the following values will be returned.

<u>value</u>	<u>clock position</u>
14	12
13	6
11	9
7	3
10	10
6	1
5	5
9	7

Although these are simple illustrations, I hope that you have the idea. There are all sorts of possibilities to try. A good example of using the joystick port for something other than playing games, is the joystick controlled menu, that appears on all JACG disks.

With a little imagination you can use your computer to read the condition of window switches, or any other project that requires a simple ON/OFF interface with the outside world. Actually these ports are not only A/D convertors, but also D/A convertors. This means that you can get them to work backwards. Its a little too technical to go into now, but if you are interested in using your computer for control purposes, your machine has this capability. A good example is the MPP modem, which does its work through the joystick port.

Next month I'll show you how to POKE SCREEN COLORS instead of using the SETCOLOR command.

GIVE A BIT!!!

Contribute to the Newsletter this month.

Of Sharks And Little Fish

by Patrick C. Madden, II - JACG

I didn't even own a computer when I first read about the strange, water-covered, toroidal planet of WATOR in the December, 1984 issue of SCIENTIFIC AMERICAN. Nevertheless, I was intrigued by the concept of simulating a mini-ecosystem on a PC. I thought about it enough that my fingers began to itch for a keyboard to try it out on. I got the chance several weeks later when I purchased an Atari 800XL (for my kids).

The idea behind WATOR is to create a two-dimensional "ocean" or grid populated by fish and sharks and let them randomly interact with one another until something interesting happens. The fish eat plankton (at least I assume they eat plankton since they never die of starvation and I don't feed them anything else) and in turn are eaten by sharks. Every so often (as often as you like, actually) they reproduce. When they are not reproducing or being eaten they swim around randomly in the "ocean". The sharks do much the same thing except of course that they eat any fish that happen to be nearby. Also, because the sharks are the bullies, we set it up so that they starve to death after some period of time without eating. (Is that realistic or what?)

The toroidal (or donut) shape of the planet Wator derives from the typical way your computer screen editor works. A point leaving the right hand side immediately reenters the screen at the same level on the left hand side. The same is true top to bottom. The reader should easily be able to show that this is equivalent to a toroid. For my purposes, I rejected the idea of using a toroidal "ocean" because it added programming steps and I wanted the program to run as fast as possible. (Maybe someone out there knows how to incorporate this feature automatically. As a novice programmer I couldn't figure out how to do it.) Anyway, my ocean is a square one with real borders.

Time on the planet WATOR is measured in "chronons" which are nothing more than cycles or "turns". During each chronon, all the fish and all the sharks get one "move". The fish move randomly into one of the vacant cells adjacent to their current position. Only orthogonal moves are allowed. The sharks first look for nearby fishes to eat; but if there are no fish handy, the sharks move randomly just as the fish do. The number of chronons it takes for the fish and sharks to reproduce or the sharks to starve to death is specified by God (you). That's pretty much it!

There are obviously several thousand different ways to simulate this simple system on a computer. And I have a sneaking suspicion that almost all of them would be an improvement over the way I did it. However, I'm confident that my way is not the worst way. The worst way was suggested by A. K. Dewdney, the author of the

SCIENTIFIC AMERICAN computer recreations column where I first got the idea. I know because I tried it his way and found it to be extremely slow and cumbersome.

Dewdney suggested following the action on the grid with five arrays: two to follow the positions of sharks and fish, two to follow moves of sharks and fish, and one to keep track of when each shark last ate. I found it much easier and faster to use only one array for positions and one array for moves. (The move array makes sure no fish moves more than once per chronon.) Fish are represented by positive numbers (the values are their age) and sharks by negative numbers. Fish and sharks breed when they reach breeding age by simply splitting like a cell into two fish. Sharks, of course, die if they haven't eaten before their "starving time".

There are only three possible outcomes to the ecological battle of WATOR - the fish "win" and eventually populate the whole grid, the sharks "win" by eating all the fish (and then lose by dying of starvation), or a stable ecological balance is achieved. In my brief investigations I never found a combination of parameters which resulted in a stable system. On one occasion I did let the program run all night and found in the morning that the sharks had died on move 250. It took the fish another 50 moves or so to completely populate the grid. (My grid is 35 by 20 and thus holds 700 fish.) For those of you who wish to observe the same system, I started with 100 fish and 20 sharks. The fish breeding time was 3 chronons while the shark breeding time was 5 chronons. The shark starving time was 3 chronons. It might be interesting to see how this system behaves with different random distributions of the same number of fish and sharks.

There are many unanswered questions about WATOR. Is it possible to create a system which is always stable? How do we know that a system that is stable for a finite period of time will always be so? What would be the effect of "smart" fish who could sense the presence of sharks and avoid them? What about smart sharks who seek out fish over a wider area? Maybe some of you JACG members could find the answers. But even if you don't, you might just enjoy watching the oceans of WATOR.

My program is simple. It contains no "peeks" or "pokes" and I feel a bit self-conscious about that. Also, I didn't "trap" any errors or try to prevent you from inputting garbage. (Please don't try to start with more than 700 fish + sharks.) No doubt some of you experts out there can improve upon it. I would especially like to get rid of the bouncing cursor in the left hand margin which seems to be a side effect of using the POSITION command. Also, any features which make the program run faster would be appreciated. You may write to me at:

Patrick Madden
13 Clemens Terrace
Whippany, NJ 07981

WATOR

```

1 PRINT "*****"
2 PRINT "*"
3 PRINT "      WELCOME TO WATOR      "
4 PRINT "*"
5 PRINT "*****"
10 DIM OCEAN(36,21), MOVE(36,21),
STARV(36,21)
11 REM
12 REM LINE BORDERS WITH "SHARKS"
13 REM
14 CYCLES=0
20 FOR I=0 TO 36
25 OCEAN(I,0)=-1: OCEAN(I,21)=-1
30 NEXT I
35 FOR J=0 TO 21
40 OCEAN(0,J)=-1: OCEAN(36,J)=-1
45 NEXT J
46 REM
47 REM ZERO ARRAYS
48 REM
50 FOR I=1 TO 35
55 FOR J=1 TO 20
60 OCEAN(I,J)=0
80 STARV(I,J)=0
90 NEXT J
99 NEXT I
100 REM INITIALIZE OCEAN
101 REM
102 PRINT "FISHNUM = NUMBER OF FISH"
103 PRINT "SHARKNUM= NUMBER OF SHARKS"
104 PRINT "FBREED = TIME (I.E. NUMBER OF
CYCLES) FOR FISH TO BREED"
105 PRINT "SBREED = CYCLES FOR SHARKS TO
BREED"
106 PRINT "STARVE = CYCLES FOR SHARK TO DIE
OF STARVATION"
110 PRINT "INPUT FISHNUM, SHARKNUM, FBREED,
SBREED, STARVE"
120 INPUT FISHNUM, SHARKNUM, FBREED, SBREED,
STARVE
121 PRINT CHR$(125)
122 LPRINT "FBREED", FBREED, "SBREED",
SBREED, "STARVE", STARVE
123 LPRINT CHR$(155)
124 LPRINT "FISH","SHARKS","CYCLE"
125 IF FISHNUM=0 THEN 180
130 FOR N=1 TO FISHNUM
140 I = INT(RND(0)*35)+1: J=INT(RND(0)*20)+1
150 IF OCEAN(I,J)<>0 THEN 140
154 REM
155 REM RANDOMIZE BREEDING TIMES
156 REM
160 OCEAN(I,J)=INT(RND(0)*FBREED)+1
165 POSITION I,J:PRINT CHR$(27);CHR$(30)
170 NEXT N
180 IF SHARKNUM=0 THEN 250
190 FOR N=1 TO SHARKNUM
200 I=INT(RND(0)*35)+1: J=INT(RND(0)*20)+1
210 IF OCEAN(I,J)<>0 THEN 200
220 OCEAN(I,J)=-INT(RND(0)*SBREED)-1
230 STARV(I,J)=INT(RND(0)*STARVE)+1
235 POSITION I,J:PRINT CHR$(8)
240 NEXT N
250 GOTO 1200
300 REM
301 REM "FISH SWIM AND BREED"
302 REM
310 FOR I=1 TO 35
320 FOR J=1 TO 20
330 IF OCEAN(I,J)=0 THEN 840
350 IF MOVE(I,J)>0 THEN 840
360 GOSUB 1000
370 II=I+A:JJ=J+B
380 IF OCEAN(II,JJ)<0 THEN 600:REM CHECK FOR
SHARK
390 IF OCEAN(II,JJ)=0 THEN 500

```

```

400 II=I-A:JJ=J-B
420 IF OCEAN(II,JJ)=0 THEN 500
430 II=I+B:JJ=J+A
450 IF OCEAN(II,JJ)=0 THEN 500
460 II=I-B:JJ=J-A
480 IF OCEAN(II,JJ)=0 THEN 500
490 GOTO 840
500 IF OCEAN(I,J)<=FBREED THEN 510
505
OCEAN(I,J)=1:OCEAN(II,JJ)=1:FISHNUM=FISHNUM+
1:POSITION II,JJ:PRINT
CHR$(27);CHR$(30):GOTO 830
510 OCEAN(II,JJ)=OCEAN(I,J)+1:OCEAN(I,J)=0
520 POSITION I,J:PRINT " "
530 POSITION II,JJ:PRINT CHR$(27);CHR$(30)
540 GOTO 830
600 REM
601 REM "SHARKS HUNT AND BREED"
602 REM
690 IF OCEAN(II,JJ)>0 THEN 800
700 II=I-A:JJ=J-B
720 IF OCEAN(II,JJ)>0 THEN 800
730 II=I+B:JJ=J+A
750 IF OCEAN(II,JJ)>0 THEN 800
760 II=I-B:JJ=J-A
780 IF OCEAN(II,JJ)>0 THEN 800
790 GOTO 850:REM NO FOOD!
800 STARV(II,JJ)=1:FISHNUM=FISHNUM-1
810 IF ABS(OCEAN(I,J))>SBREED THEN
OCEAN(I,J)=-1:STARV(I,J)=1:OCEAN(II,JJ)=-1:S
HARKNUM=SHARKNUM+1:GOTO 825
815
OCEAN(II,JJ)=OCEAN(I,J)-1:OCEAN(I,J)=0:STARV
(I,J)=0
820 POSITION I,J:PRINT " "
821 POSITION II,JJ:PRINT CHR$(8)
822 GOTO 830
825 POSITION II,JJ:PRINT CHR$(8)
830 MOVE(II,JJ)=1
840 NEXT J
841 NEXT I
842 GOTO 1200
850 IF STARV(I,J)>STARVE THEN
OCEAN(I,J)=0:STARV(I,J)=0:SHARKNUM=SHARKNUM-
1:POSITION I,J:PRINT " ":GOTO 840
851 REM
852 REM NO FISH NEARBY, SHARK NOW MOVES LIKE
A FISH
853 REM
855 II=I+A:JJ=J+B
865 IF OCEAN(II,JJ)=0 THEN 920
870 II=I-A:JJ=J-B
880 IF OCEAN(II,JJ)=0 THEN 920
885 II=I+B:JJ=J+A
895 IF OCEAN(II,JJ)=0 THEN 920
900 II=I-B:JJ=J-A
910 IF OCEAN(II,JJ)=0 THEN 920
915 STARV(II,JJ)=STARV(I,J)+1:GOTO 840
920 STARV(II,JJ)=STARV(I,J)+1:GOTO 810
1000 REM
1001 REM RANDOMLY SET A,B TO 0/-1/+1
1002 REM
1010 N=INT(RND(0)*4)
1020 ON N+1 GOTO 1030,1040,1050,1060
1030 A=1:B=0:RETURN
1040 A=0:B=1:RETURN
1050 A=-1:B=0:RETURN
1060 A=0:B=-1
1070 RETURN
1200 REM
1201 REM
1210 POSITION 2,22
1220 PRINT "FISH ";FISHNUM;" SHARKS
";SHARKNUM;" CYCLES ";CYCLES;" "
1223 LPRINT FISHNUM,SHARKNUM,CYCLES
1230 IF FISHNUM=0 AND SHARKNUM=0 THEN GOTO
1260
1240 CYCLES=CYCLES+1
1241 FOR I=1 TO 35

```


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